

THE REVIEW

DEVOTED TO THE INTERESTS OF THE AMERICAN SOCIETY FOR METALS

Volume XV

MARCH, 1942

No. 3

Cleveland Chapter War Products Advisory Committee Meets



The First Meeting of the Cleveland Chapter A.S.M. War Products Advisory Committee Was Held on Monday, Feb. 9, in the Statler Hotel. Seated around the table, starting at the left, are J. Edward Donnellan of the National Office staff, W. F. Aylard, P. J. Gygi, Walter Clark, A. C. Furman, J. R. Thompson, Waldemar Naujoks, William C. Stewart, general chairman of the Committee; A. C. Denison, Hugh E. Brown, Ralph G. Kennedy, Jr., A. M. Thurston and George Sacha (in background), Kent R. Van Horn, and A. E. R. Peterska.

Warns Against Generalization in Problem Of Weldments Vs. Castings Vs. forgings

Reported by Fred P. Peters

Managing Editor, *Metals and Alloys*

To A. L. Boegehold, chief metallurgist, General Motors Research Laboratories, Detroit, on the award of the J. H. Whiting Gold Medal of the American Foundrymen's Association; also to John E. Galvin, president, Ohio Steel Foundry Co., Lima, Ohio, on the award of the John A. Penton Gold Medal of the A.F.A.

To Robb W. James and G. J. Hale, now employed in the Cleveland Ordnance District, on their promotion from the rank of lieutenant to captain.

To Puget Sound Chapter Secretary-Treasurer Monte E. Parker on being granted a lieutenant commander's commission in the U. S. Navy in the field of metals, with tentative assignment to Charleston, S. C. Ralph Winship, salesman, Columbia Steel Co., has been appointed acting secretary-treasurer until election of new officers.

Merits of Steam and Air Hammers Are Debated

Reported by H. C. Miller

Heat Treat Foreman, Greenfield Tap & Die Corp.

Springfield Chapter—George Ligertwood, special engineer for the Moore Drop Forging Co., was guest speaker at the Jan. 19th meeting.

Mr. Ligertwood's subject, "Forging Practice", proved very interesting and instructive. After giving a brief history of the art of forging, he showed some slides of various types of equipment and forgings. This was followed by motion pictures taken in the shops of the Transue & Williams Co. of Alliance, Ohio.

The question and answer period following Mr. Ligertwood's talk brought forth a lively discussion on the relative merits of steam versus air hammers.

Dues Waived for Soldiers

Attention of A.S.M. members is called again to a ruling by the Board of Trustees at its meeting in November, 1940. The Board at that time authorized the waiving of further payment of dues for members during the time of their military service up to the rank of commissioned officers. (Continued on page 7)

A.S.M. Nominating Committee Appointed To Name Officers

IN ACCORDANCE with the constitution of the American Society for Metals, President Bradley Stoughton has selected a nominating committee from the list of candidates submitted by the Chapters as follows:

James T. MacKenzie, American Cast Iron Pipe Co., Birmingham, Ala. (Southern Chapter), Chairman.

I. N. Goff, Consulting Metallurgical Engineer, 3771 Polk, Gary, Ind. (Calumet Chapter).

Clarence H. Lorig, Battelle Memorial Institute, Columbus, Ohio (Columbus Chapter).

John E. Dorn, Department of Mechanical Engineering, University of California, Berkeley, Calif. (Golden Gate Chapter).

Alexander Finlayson, Pacific Car & Foundry Co., Renton, Wash. (Puget Sound Chapter).

Ray McBrien, Denver & Rio Grande Western Railroad Co., Denver, Colo. (Rocky Mountain Chapter).

H. L. Hovis, Hamilton Watch Co., Lancaster, Pa. (York Chapter).

This committee will meet during the third full week in the month of May, and shall name one candidate for each of the following offices:

President	1 year
Vice-President	1 year
Secretary	2 years
Two trustees for	2 years each

The committee will welcome suggestions for candidates in accordance with the Constitution, Article IX, Section 1 (b), which provides that endorsements of a local executive committee shall be confined to members of its local Chapter, but individuals of a Chapter may suggest to the nominating committee any candidates they would like to have in office. Endorsements should be sent in writing to the chairman or other members of the committee.

Troubles That Plague Heat Treater Cited

Reported by Albert Rauch

Deere & Co.

Tri-City Chapter—"Heat Treatment of Tool Steels" was the title of the lecture delivered by Roy G. Roshong, consulting metallurgist, Harvey S. Pardee and Associates, Chicago, on Feb. 10. Approximately 200 attended the meeting, which, in addition to being a regular monthly meeting, was also the fourth session of the educational course, "Tool Steels", sponsored by the Tri-City Chapter.

Mr. Roshong discussed the various types of tool steels, the effect of the alloying elements, atmospheres, quenching media, annealing, tempering, stress relieving, nitriding, and design.

Stress Relieve After Machining

The various machining and forming operations require different structures for optimum results. No one annealing procedure will give best results for all types of operations.

The importance of stress relieving at 1275 to 1325° F. after rough machining to minimize the danger of warping during heating for hardening was emphasized.

Some of the troubles that occasionally plague the heat treater, such as the use of the wrong steel, sharp corners, rough tooling, and deep stamp marks, were discussed and illustrated by slides.

Preceding the main talk, the excellent colored motion picture, "Heat Treating Hints", was presented through the courtesy of the Lindberg Engineering Co. Many practical and interesting procedures were shown in the picture.

Foundry Congress & Show Is Setting New Records; Will Stress War Problems

The Foundry and Allied Industries Show to be held in conjunction with the First Western Hemisphere Foundry Congress and the 46th Annual Convention of the American Foundrymen's Association in the Public Auditorium, Cleveland, Ohio, April 20 to 24, will demonstrate what the entire castings industry is doing toward waging and winning the war.

Through technical sessions, informative talks, exhibits of equipment and supplies, ordnance exhibits, government "clinics" and displays, and above all, through personal contacts with men, materials and machines, the Congress will inspire solutions for many problems created by the war.

A record-breaking attendance and list of exhibitors are expected for this event, in keeping with the largest-in-history attendance at the National Metal Congress sponsored by the American Society for Metals in Philadelphia last fall, which also strongly featured war problems.

The many members of the A.S.M. who will be in attendance at the Foundry Congress in Cleveland are cordially invited to call and inspect the new headquarters of their Society at 7301 Euclid Ave., Cleveland.

THE REVIEW

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RAY T. BAYLESS.....Editor
M. R. HYSLOP.....Managing Editor

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Function of Aircraft Materials Lab Shown

Reported by James W. Poynter
Asst. Met., Army Air Corps, Wright Field

Dayton Chapter—A three-star program featured a joint meeting with the S.A.E. on Feb. 11.

The first speaker was R. C. Surran, agent in charge of the Cincinnati office of the F.B.I., who described the organization and its functions.

Next a sound picture in color, "Winged Horizons", portraying the flight of a strato-liner from New York to Los Angeles, was presented through the courtesy of Transcontinental and Western Air, Inc. Details of the operation and servicing of the planes, as well as the scenery along the route, were interestingly shown by this well-photographed film.

L. P. Wood of the Curtiss Wright Corp., Columbus, Ohio, gave a talk on the "Functions of an Aircraft Materials Control Laboratory". The basic function of the laboratory is to "control the quality of the airplanes turned out".

The lab is divided into two parts, chemical and metallurgical. The duties of the laboratory were discussed under four headings: Direct quality control of the materials and processes, trouble shooting, consultation and advice, and industrial research on materials and processes.

Monte Carlo Party Again Proves a Popular Event

Reported by J. M. Gotshall
Assistant Chief Chemist
Timken Steel and Tube Division

Canton-Massillon Chapter—As has been the case for the past seven years, the Midwinter Frolic on Feb. 20, was again a "Monte Carlo" party. This type of party grows in popularity from year to year and 275 members and guests were present this year.

All sorts of games of chance were played with A.S.M. money printed for this purpose and many worth-while prizes were given to the winners. Door prizes and odd money prizes were also part of the program. An excellent buffet lunch was served after the games.

Garland M. Riegel, chairman of the Entertainment Committee, deserves a lot of praise for so ably handling the arrangements preparatory to this affair. Harry White, George Barrow, Arlo Hansen, H. E. McKimmy, Sidney Poole, Henry Tobey and E. R. Vance comprised the committee.

L. R. Foote Compares Advantages of Coal, Oil, Electricity & Fuel Gases

Reported by V. C. Leatherby
Eclipse Fuel Engineering Co.

Rockford Chapter—L. R. Foote, industrial engineer of the Central Illinois Electric and Gas Co., discussed "Factors Considered in Selection of Industrial Fuels" at the dinner meeting on Jan. 28 at the Elks Club.

Each of the fuels—coal, oil, electricity, and the gases including natural, manufactured, butane and propane—were mentioned, and their advantages and disadvantages compared for industrial heating applications.

Mr. Foote is a graduate of Brown University and has had considerable fuel experience, having been with an Eastern utility before coming with the local company. He is a past chairman of the Rockford Chapter.

Preceding the regular meeting and Mr. Foote's talk, a very interesting discussion of federal and local conservation was given by Thomas Horrall and Dick Horrall, who are teachers in schools in this vicinity.

Steel in Cast Iron Charge Improves Physical Properties

Reported by E. J. McKnight
Griffith Wheel Co.

Rocky Mountain Chapter—Tom C. Muff of the West Coast Division of Sorbo-Mat Process Engineers gave a talk on cast iron on Jan. 16. This was mainly concerning the effect of steel in the charge on the physical properties of cast iron as poured into the mold.

Three irons with different percentages of steel in the base charge, but with substantially the same chemical analysis, were found to vary widely in tensile strength.

For instance, an iron with no steel in the base charge had a tensile strength of 43,830 psi.; with 35% steel, but the same chemical analysis, it had 54,270 psi. tensile strength; and with 75% steel, it was 72,880. Corresponding improvements were noted in transverse load and deflection.

Further Tests Needed

Mr. Muff did not wish to give any definite reason at this time why additions of steel to the base charge should improve the physical properties of cast iron because the tests have not progressed to a point where anything positive can be concluded.

However, he did say it was not because of reducing the total carbon, for, with very little variation, charges were calculated to, and did, produce irons very close in total carbon content. Automobile steel and cast scrap were used entirely.

Mr. Muff was grilled thoroughly, and while admitting several interesting possibilities might have some bearing on the results, more work should be done before making any definite commitments.

As an added feature, Kent Thomas, district publicity representative of General Electric Co., displayed a "new type of advertising picture" entitled "Railroading" which contained a half hour of excellent entertainment.

THE METAL MEN'S MORALE

(Being the epic of W. L. "Keep-It-Clean" Hults, who bolstered Civilian Morale during the dark days of mid-December by successfully decontaminating New Jersey Chapter's Christmas Smoker in the face of tremendous odds!)

By Fred P. Peters

Managing Editor, *Metals and Alloys*

Listen my children—and you, too, adults—to the soul-stirring saga of "Keep-It-Clean" Hults. That vicar of virtue and shamer of sin, Who guarded our goodness through thick and through thin.

Ten days before Christmas he called in his men. "I'm running the Smoker in Newark again. What's more, I've been told by a patriot-pal That attempts will be made on Civilian Morale!"

"For Civilian Morale can be shattered, you know. By diverting men's minds from the high to the low. And the thoughts of our 800 guests may be turned From the Main Job at hand lest we're careful, I've learned."

"So for the program I've planned for this evening's affair Will be stripped of all evil—or wickedness bare! There'll be dinners and prizes and laughter and song. But the beers will be short and the dances long."

"The girls will be there and they'll dance, it is true, And maybe they'll kick up a rumpus or two. However, we'll fight them—grim warnings dispel— As soon as the frolic gets slightly risqué."

So he stationed his minions strategically there, With signs reading "Eyes Front!" and "Treason to Stare!" While a third man paraded in red, white and blue, His motto: "A Shut-eye Means Glory for You!"

"Keep Your Mind on Your Job, There's a War to be Won, And You Can't Lick the Japs Watching Capes Come Undone!" Was the message a fourth tooted over his back, But the fun just went on—oh, alas! and alack!

So Hults, overtaken with feverish zeal, Decided to offer one final appeal—with the show whirling 'round him, he shouted, "Now who, If an air raid should strike us, would know what to do?"

Say, I never heard such a unified roar As the singular answer that came from the floor. When those 800 throats gave this now-famous cry: "We'd turn down the lights 'til the sweet bye-bye!"

Well, Civilian Defense on one lesson depends: You must dim all the lights 'till the air attack ends. And Hults was transfixed with the knowledge, at last, That his gallant crusade a success must be classed.

Subversive attacks on morale had been stilled, And he had (although barely) his nickname fulfilled. But with even more brilliance he saw a new light—That parties like this were an aid to The Fight!

Though tungsten was short and the chrome running out, And nickel was something you just did without, You could have all the giggles (and wiggles) desired, And no preference rating as yet was required.

Side-Blown Converter Is Revived for Steel Casting

Reported by Robert D. Stout
Lehigh University

Lehigh Valley Chapter—The Fourth Annual Stoughton Night, held on Feb. 6, bore special significance this year since Professor Stoughton is now the A.S.M. national president.

Dr. G. B. Waterhouse was present from Washington as the technical speaker, and discussed "Steel Castings in the War Program". Included in his talk were statistics on past and future production of steel castings.

Interesting comments were given on the revival of the side-blown converter for use in steel foundries. Professor Stoughton was responsible for development of that process years ago.

Dr. Waterhouse also discussed the casting of armor steel.

General discussion after the talk dealt with dephosphorization of hot metal by the Yocom method and with the difficulty of getting Army acceptance of steel castings made from the side-blown converter.

 L. R. Foote

each of the fuels—coal, oil, electricity, and the gases including natural, manufactured, butane and propane—were mentioned, and their advantages and disadvantages compared for industrial heating applications.

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City Gas Manufacture And Distribution Problems Explained

Reported by John R. Dobie
American Steel & Wire Co.

Worcester Chapter—A. C. Frey, general manager of the Worcester Gas Light Co., addressed the Chapter on Jan. 7. Speaking on "City Gas Manufacture and Distribution", he used a working model of a water gas unit in actual operation to show the effect of oil inspiration on the pure water gas.

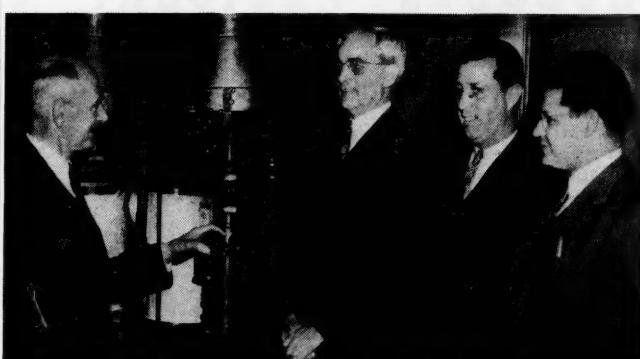
Mr. Frey traced the history of the gas industry from its inception as a means of light in the 1860's through its growth and changes. The load is now approximately 50% for domestic uses, 25% for industrial use, and the remaining 25% for home heating, water heating and commercial uses.

The two main manufacturing processes—namely, the coal gas and the water gas methods—were explained. The water gas method has been almost universally adopted in New England plants, since coke and oil are the cheapest fuels and are mostly used for gas making in this area.

Problems in distribution were considered, and Mr. Frey pointed out that the number of cubic feet of gas pumped at one end of a line will deliver the same amount 30 or 40 miles away. The pressure will drop but the heating value remains the same as well as the quantity.

New methods to meet peak loads include storage of gas at outlying points in reservoirs filled during low load periods. This has been done to save outlay

A. C. Frey Speaks at Worcester Chapter



Arthur C. Frey, General Manager of the Worcester Gas Light Co., Demonstrates a Working Model of a Water Gas Unit at the January Meeting of the Worcester Chapter. Next to him stand Andrew J. Huston, industrial engineer, Worcester Gas Light Co., technical chairman for the meeting; John L. Turnan, assistant superintendent, Worcester Gas Light Co.; and Robert I. Belmont, superintendent of L. Hardy Co., chairman of the Chapter.

on larger feeder pipes from the manufacturing plants.

In closing, Mr. Frey said that taxes are a high load on the utilities. Their investments in equipment and distribution systems are far above those of the average industrial concern. Taxes for the Worcester company are about 15¢ on every dollar received from the consumer.

An interesting question period led by Andrew J. Huston, technical chairman of the meeting, followed. A dinner in Sanford Riley Hall, W.P.I., preceded the speaking program.

Shop Problems in Hard Facing Confused By Difference in Hardness, Wear Quality

Reported by James C. Erickson
Deere & Co.

Tri-City Chapter—J. C. Menzies, vice-president, C. E. Phillips & Co., Chicago, addressed the January meeting on "Hard Facing in General Shop Work".

Mr. Menzies' talk cleared up many of the problems of both the shop superintendent and the hard facing representative. Since the usual question asked the representative is "How hard is it?", he went to considerable length to emphasize the difference between hardness and wear resistance.

It is a general belief among those concerned with wear resistance that hardness is directly responsible for wear resistance. On the contrary, however, hardness is an indirect property secured as a result of obtaining the wear resisting properties.

The structure of the heterogeneous hard facing material consists of hard particles of carbides embedded in a soft matrix of mild steel. By hardness testing such a structure the soft matrix would perhaps give hardness readings lower than that of a hardened and tempered steel which may have much less wear resisting qualities.

It is important, then, that a wear resistance test be used to determine the proper material. Such a test is grinding, which is a form of abrasion. Hard facing material is difficult to grind as compared to hardened steel, regardless of hardness.

Mr. Menzies used the carbide type of rod for a description of a hard facing welding rod. This is a tubular rod filled with tungsten carbide particles.

A deposit from such a rod is heterogeneous, consisting of tungsten carbide particles in a soft steel matrix. The wear resistance of such a deposit depends upon the distribution and the amount of the carbide particles.

An addition of 12% cobalt to the car-

bide produces a tougher hard facing material with wear resistance comparable to the straight carbide type. However, for such jobs as cutting on oil field drilling heads, the tougher carbide particles with the cobalt addition lose their sharpness by rounding. This is not true for the straight carbide type which is a suitable hard facing for cutting tools.

Charles F. McGraw, biologist, Soil Conservation Service, U. S. Department of Agriculture, gave an interesting coffee talk entitled "Soil Erosion and Its Control".

Plastics Is Subject for Sustaining Members Night

Reported by J. T. Ballard
Quaker Chemical Products Co.

Hartford Chapter—The February meeting was "Sustaining Members Night", with a special invitation to non-members.

The group of 90 guests at the City Club dinner was swelled to nearly 200 at the meeting at the Hartford Electric Light Co. The usual coffee talk was replaced by some movies of the Pearl Harbor episode.

The speaker was Dr. A. Allan Bates, manager, department of chemical and metallurgical research, Westinghouse Electric & Mfg. Co.

To his subject, "Plastics Vs. Metals", he gave the intriguing title, "Cellulose to Snuggies", and talked at great length about the varied and many uses of plastics.

Dr. Bates illustrated his talk with a full complement of samples and showed some pictures of aircraft, motorboats and a full-fledged Ford car, all made of suitable plastics.

Dr. Woodward, of Underwood Elliott Fisher Co., was the technical chairman of the evening. Doughnuts and coffee were served after the lecture.

Materials Engineer, Bethlehem Shipbuilding Div.

Boston Chapter—At the February meeting Major Ray H. Stone, staff officer, Massachusetts State Guard, presented a coffee talk on the development of the civilian air defense units in Massachusetts.

Ray Sault, who acted as technical chairman, introduced A. D. Bach, former chairman of the Boston Chapter and president of the New England Metallurgical Corp. Everyone remembered A. D.'s last talk to the Boston Chapter about three years ago and the hall was filled to capacity.

Slides were used to illustrate the problems which the commercial heat treater encounters in hardening and straightening various types of tools. It was demonstrated that the proper design of tool and the selection of the proper alloy for the tool are well worth while from the viewpoint of both the heat treater and the user of the tool.

A. D.'s talk was unusual inasmuch as it was a well-balanced combination of technical and practical knowledge. Interest was added by the fact that he used kodachrome slides throughout, many of which included members of the Boston Chapter who are employed by New England Metallurgical Corp.

Inspector Must Keep Rejects At a Minimum

Reported by Richard Grinnal
International Harvester Company

Chicago Chapter—February 12 was "Inspector's Night" and featured an interesting talk on "Intelligent Inspection" by Dr. A. B. Kinzel, chief metallurgist of the Union Carbide and Carbon Research Laboratories, Inc.

Also on the program were two motion pictures—the Phelps Dodge Corp.'s "Copper From Mine to Market", and an appropriate Lincoln's Birthday picture.

According to Dr. Kinzel, the primary duty of an inspector is to accept the greatest possible amount of satisfactory material, and to reject only that material which he is sure is not suitable. The utilization of a maximum amount of material is very necessary at the present time.

Reasoning Behind Specifications

When examining materials an inspector should always keep in mind, in addition to the rigid written specification, the reason why particular specifications were made. In chemical specifications for steels the chemical analysis usually represents certain physical properties which may or may not be characteristic of other steels.

Before rejecting any material on chemical specifications, an inspector should always contact his superiors or the person who wrote the specification, to determine whether the doubtful lot can be used despite its non-conformity.

A second important phase of inspection is usually involved in the measurement of dimensions, as on a machined part. Here there can be no deviation from specifications, and the inspector must see that his gages are correct.

Comparing Photographs

In addition, he should advise responsible persons of any shift of measurements toward one of the limits of the specification. This will allow correction of the condition causing the shift before any bad work is turned out, and will result in maximum economy.

In inspections involving comparison of samples with standard photographs the inspector should consult the photographer and determine the reason why the particular standards in use were selected. It is very improbable that any samples will appear exactly like the ones photographed.

Dr. Kinzel then gave some pointers on specification writing, and closed his talk with a plea for constant vigilance on the part of inspectors.

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J. R. MacAllister, Recorder

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Texas Chapter ASM-WPAC

W. S. Abbott, Metallurgist, Hartwell Iron Works; Herbert A. Clark, Engineer, Cameron Iron Works; H. A. Andrews, Plant Superintendent, General Metals Corp.; R. F. Arnoldy, District Engineer, Linde Air Products Co.; L. H. August, Foundry Engineer, Hughes Tool Co.; C. A. Backer, Production Manager, Cameron Iron Works; H. H. Brien, Sales Manager, Texas Foundry, Inc.; W. E. Burndrett, Chief Engineer, Hughes Tool Co.; L. H. Collier, District Manager, Warren & Sons Sales Co.; H. E. Collins, Foreman of Tool Room, Hughes Tool Co.; J. Deo, Owner, Dee Brass Foundry; E. E. Dillman, Engineer, Engineers & Fabricators; F. E. Doty, Proprietor, Engineering Sales Co.; Herbert Elmer, Foundry Superintendent, Dedman Foundry; W. L. Fairbanks, Chief Tool Engineer, Reed Roller Bit Co.; R. M. Garrison, Chief Engineer, Mission Mfg. Co.; G. Gentry, Shot Superintendent, Mission Mfg. Co.; C. C. Goolsby, Welding Engineer, Reed Roller Bit Co.; W. H. Greer, Inspector, Southwestern Laboratories; W. W. Hampton, Production Manager, Hughes Tool Co.; T. D. Ketchbach, Proprietor, Industrial Welding and Testing Laboratory; R. B. Kinzbach, Vice-President, Kinzbach Tool Co.; W. A. Kuennenm, Industrial Engineer, Houston Light & Power Co.; J. M. Kuebler, Foundry Superintendent, Southern Pacific Lines; Karl E. Lager, Metallurgist, Carnegie-Illinoi Steel Corp.; R. E. McArdle, Proprietor, McArdle Equipment Co.; C. E. Olsen, President, Gearinch Mfg. Co.; L. M. Poff, Inspector, Byron Jackson; J. M. Robertson, Industrial Engineer, Houston Natural Gas Corp.; D. K. Robinson, Industrial Engineer, Houston Light & Power Co.; A. R. Rudolph, Manager, Div. of Electrical Plating Co.; R. W. Schlumpf, Chief Electrical Engineer, Hughes Tool Co.; C. H. Shapiro, Chief Metallurgist, Reed Roller Bit Co.; R. B. Shoop, Chief Engineer, Houston Blow Pipe & Sheet Metal Works; L. D. Sugg, Supervisor, Linde Air Products Co.; C. K. Tharp, Metallurgist, Texas Electric Steel Casting Co.; B. A. Todd, Superintendent, Oil City Brass Works; A. Vallance, Chief Design Engineer, Reed Roller Bit Co.; G. R. Walton, Industrial Engineer, United Gas Pipe Co.; F. M. Wittlinger, Secretary, Texas Electric Steel Casting Co.; G. W. Woods,

Welding Engineer, Hughes Tool Co.; A. P. Wright, District Representative, Carpenter Steel Co.; J. R. Yancy, Chief Engineer, Gray Tool Co.

Write or Phone:
Charles F. Lewis, Chairman
Cook Heat Treating Co.
Box 262, Houston, Texas
Wayside 4181

★ ★ ★

Toledo Group ASM-WPAC

Robert L. Adams, Metallurgist, National Supply Co.; H. Kenny Burch, Engineer, The Toledo Edison Co.; William J. Burr, Metallurgist, Lincoln Steel Mfg. Co.; James H. Dodge, Lathe & Electric Steel Co.; Harry H. Heinrich, Metallurgist, National Supply Co.; A. L. Keshaw, Manufacturers' Representative; Leighton M. Long, Met. Engineer, Bunting Brass & Bronze Co.; O. C. Schultz, General Superintendent, National Supply Co.; Leo L. Vasold, Metallurgical Engineer, Electric Auto-Lite Co.; Ralph S. Wenner, Industrial Manager, Ohio Fuel Gas Co.; S. L. Widrig, Chief Metallurgist, Spicer Mfg. Corp.; Victor E. Zang, Works Manager, Steel Casting Division, Unit-Cast Corp.

Write or Phone:
Charles C. Eeles, Coordinator
Ohio Fuel Gas Co.
231 Huron St., Toledo, Ohio
Adams 9101

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Tri-City Chapter ASM-WPAC

H. N. Bristow, Chairman
Deere & Mansur Works
Moline, Ill.
Moline 3400

Boston Beau Brummells and Desperate Desmonds



At Left, Past Chairman and Constable "String" Downing Takes Care of an Obstrepreneur Member of the Boston Chapter During the Mid-Winter Quench and Draw Party. Center is Executive Committeeman Horace Ross dancing the can-can with one of the girl friends, while Vice-Chairman Amos McDuff (right) will have a hard time finding an alibi for this one.

Stoughton Stresses Metal's Part in War

Reported by J. Ernest Hill

Metallurgist, Tennessee Coal, Iron & R. R. Co.

Southern Chapter — The Stoughton meeting in Birmingham, at the Tullier Hotel on Jan. 30, began in the Oak Room with a delicious dinner of southern fried chicken. In the very best of spirits the group adjourned to the Terrace Ballroom for the address of the evening.

Dr. Bradley Stoughton, dean of engineering at Lehigh University, and national president of the A. S. M., gave a most informative and extremely interesting treatise on "Metallurgy and Its Relationship to National Defense".

In his introductory remarks Dr. Stoughton stated that wars prior to 1870 were won by human strength, the World War of 1914-1918 might be called a chemical war, and that this war of today is a war of metals.

Dr. Stoughton led us carefully along the narrowing aisles of our country's supply of tungsten, chromium, cobalt, tin, zinc and magnesium, showing us what we have on hand at present and giving us an idea of what we can expect in the future.

Quite a number of visitors were present from the Association of Iron and Steel Engineers, American Institute of Mining and Metallurgical Engineers, Foundrymen's Club, Engineers Club, and other men with technical interests. Hardly a seat was left unoccupied in the ballroom.

Costumes of Nineties Add Atmosphere to Annual "Quench and Draw" Party

Reported by Paul Field

Materials Engineer, Bethlehem Shipbuilding Div.

Boston Chapter — Costumes reminiscent of the Nineties lent a carefree atmosphere to the Mid-Winter Quench and Draw Party, held at the Alpine on Friday, Feb. 20, under the direction of Vice-Chairman Amos McDuff.

The evening started off with a period devoted to "allocation of quenching media", permitting members to relax and assume the proper mood for the excellent dinner which followed. During the dinner the mistress of ceremonies and the hostesses entertained with songs and dances. Music was furnished by the "Alpineers".

Horace Ross was favored with the title of "best dressed man" by the mistress of ceremonies and was presented with a bottle of champagne which proved to be of the "fast drying" variety. "String" Downing was an excellent Mack Sennett constable and a zealous dealer of justice.

The motto for the evening was "Relaxation in Moderation will keep you fit for the Duration".

Non-Ferrous Foundry Practice Discussed

Reported by H. E. Hostetter

Metallurgical Engineer, Climax Molybdenum Co.

St. Louis Chapter — To persons devoid of metallurgical sympathies the St. Louis members indulged in what must have seemed a prolific usage of rubber by traveling to nearby Alton, Ill., for the second time this season to hold the January dinner meeting and to hear Albert Vigne of Bronze Alloys Co., St. Louis, discourse on the topic "Non-Ferrous Castings".

Dealing chiefly in generalities, Mr. Vigne pointed out some of the many difficulties that confront the non-ferrous foundry in its attempt to produce castings of uniform quality. Because of customer pressure for low price the foundry must of necessity melt rerun metal and scrap of unknown analysis, both of which contribute markedly to mysterious ailments caused by residual elements.

In many cases, however, better castings would be produced if specifications permitted concentrating on the physical properties required rather than the chemical composition.

Concluding, Mr. Vigne predicted that a brighter day is in the offing for the non-ferrous foundry because of the probable amount of study and research that will be necessary to meet the requirements of the airplane industry.

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Fundamental Features of Controlled Atmospheres—By H. W. Gillett and B. W. Gonsler, Battelle Memorial Institute. Chemical Equilibrium as a Guide in the Control of Furnace Atmospheres—By J. B. Austin and M. J. Day, U. S. Steel Corp. Prevention of Oxidation Type of Reaction—Ferrous Metals—By A. G. Hotchkiss and H. W. Webber, General Electric Co. Prevention of Oxidation Type of Reaction in the Heat Treatment of Copper and Its Alloys—By E. G. deCorneille and Wm. Lehrer, Surface Combustion Corp. The Heat Treatment of the Chromium-Carbon Stainless Steels—By W. E. Mahin and W. C. Troy, Westinghouse Electric & Mfg. Co.

Control of Controlled Atmospheres—Equipment, Instruments and Costs—By Edward E. Sloviter, Battelle Memorial Institute.

Atmospheric Control in the Heat Treatment of Aluminum Products—By P. T. Stroup, Aluminum Company of America.

Atmospheric Control in the Heat Treatment of Magnesium Products—By C. E. Nelson, Dow Chemical Co.

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What's New in Manufacturers' Literature

Interesting and valuable new book, "DoAll on Production", describes and illustrates the fastest precision method for removing metal. Continental Machines, Inc. Bulletin Kd-10.

Five new brochures have been added to the Firthite General Purpose Tool line and are included in the new price list just off the press. Firth-Stirling Steel Co. Bulletin BI-177.

New 36-page Kennametal catalog illustrates specific uses of tools and blanks, describes selection and design in a comprehensive and practical manner. McKenna Metals Co. Bulletin BI-238.

"Are your machines running a good race with minutes?" is the title of an interesting booklet showing how Gulf Oil Co. is helping speed up production in the metal working industry. Bulletin BI-360.

"Cutting Fluids" is the title of an attractive new booklet published by Standard Oil Co., New Jersey. Selection of cutting fluids, suggestions for handling them and a brief history of past and present practices in their use are presented. Bulletin AF-333.

Metal Saw. Wels Mfg. Co. Bulletin He-316.

Cutting Oils. Cities Service Oil Co. Bulletin EC-113.

High Production Stamping machine. Chamberlain Engineering Co. Bulletin Gc-132.

Cutting Oil Handbook. D. A. Stuart Oil Co. Bulletin Ke-118.

Presses for Powder Metallurgy are described in new and complete 48-page catalog issued by F. J. Stokes Machine Co. Bulletin AF-335.

Semi-automatic cutoff machine for accurate high speed cutting of tubes, rods or shapes up to three inches O.D. is described in new bulletin issued by Pines Engineering Co., Inc. Bulletin CI-364.

New catalog and revised price list of Vasco-carb Ramet Tantalum-Tungsten Carbide Tools and Blanks lists 22 typical styles of single point tools, together with a grade selector chart recommending the use of Ramet Carbide for practically every cutting condition in steels, cast iron and abrasive materials. Vasco-carb Ramet Corp. Bulletin CI-332.

Hardsteel Drills. Black Drill Co. Bulletin Ne-328.

Hot working and heat treatment, forging and applications of Jessop Lion extra carbon tool steel are described in leaflet by Jessop Steel Co. Bulletin Kd-173.

Conservation of vital steel alloying elements by the use of hard facing is discussed in 14-page booklet issued by Coast Metals, Inc. Bulletin BI-361.

Hard Facing Alloys. Wall-Colmonoy Corp. Bulletin Kd-85.

Die Steels. Latrobe Electric Steel Co. Bulletin Ld-200.

Steel Data. Vanadium-Alloys Steel Co. Bulletin Kd-294.

Nitralloy Data Book. Nitralloy Corp. Bulletin Ke-116.

Uses and properties of molybdenum steels and irons. 125-page book by Molybdenum Corp. of America. Bulletin Ge-312.

New High Tensile Low Alloy Steels. 20-page booklet by Great Lakes Steel Corp. Bulletin Kd-229.

Graphitic Steel Booklet. Steel & Tube Division, Timken Roller Bearing Co. Bulletin Ne-71.

Physical characteristics chart on the Elastal group of machinery steels by Horace T. Potts Co., Brown-Wales Co., and Beals, McCarthy & Rogers. Bulletin Ed-264.

Stainless-Clad Steel. Ingersoll Steel & Disc Div., Borg-Warner Corp. Bulletin Kd-253.

Loss-of-tension book on molybdenum steels. Climax Molybdenum Co. Bulletin Hb-4.

Molybdenum-Tungsten High Speed Steels. Cleveland Twist Drill Co. Bulletin De-103.

Handy 68-page catalog describes the complete line of steels, their properties, physical characteristics, available through A. R. Purdy Co. Inc. Bulletin CI-269.

A chromium-vanadium die steel, its heat treatment and properties, is discussed in "Vanadium Facts"—a new record of applications and accomplishments of chromium-vanadium steels, irons and other metals, published by Vanadium Corporation of America. Bulletin CI-27.

Simplified method for calculating heat treatment of alloy steels is provided in handy circular heat treatment charts developed by Peter A. Frasse & Co., Inc. Physical properties of various alloy steels at six different draw temperatures are shown. Bulletin CI-172.

Four Coppco tool steels are described and typical uses listed in new illustrated leaflet issued by Copperweld Steel Co. Bulletin CI-311.

An extensive new data sheet entitled "chart acerating on Reosteel Stainless Steel" shows in tabular form the important information necessary in specifying or using various grades. Crucible Steel Co. of America. Bulletin CI-367.

Platinum Metal Catalysts. Baker & Co., Inc. Bulletin Af-337.

Aluminum Castings. National Bronze & Aluminum Foundry Co. Bulletin Ds-307.

Various applications for the bearing metals and castings manufactured by National Bearing Metals Corp. are described in new Bulletin AF-338.

Downmetal Data Book. Dow Chemical Co. Bulletin Ec-215.

Copper and Copper Alloys. Reverse Copper & Brass Co. Bulletin Ke-239.

Applications of Ampco metal. Ampco Metal Ind. Bulletin Ke-175.

Welding Stainless. Page Steel & Wire Div., American Chain & Cable Co., Inc. Bulletin Ne-86.

Welding technique and application of Ampco Trode coated aluminum bronze welding rod. Ampco Metal Ind. Bulletin Af-175.

Argon welder especially developed for rapid high quality fabrication of aircraft tubing and all thin-gage metals. General Electric Co. Bulletin BI-60.

An attractive new 38-page booklet describes Hobart Brothers Co. line of arc welders and accessories. Bulletin Af-20.

New circular describing two-stage "Regulator" for producing a non-fluctuating welding flame. National Cylinder Gas Co. Bulletin AF-331.

50-page plastic bound book showing products of Air Reduction Sales Co. Bulletin Le-69.

Electrode quantity and welding time graph. Arcor Corp. Bulletin Ld-191.

Low Temperature Welding Alloys. Eutectic Welding Alloys, Inc. Bulletin Be-301.

Thermal welding processes and applications. Morris & Tammie Corp. Bulletin Ke-64.

Brazing in the Alas-Hulgren electric salt bath furnace. Ajax Electric Co. Bulletin Ke-43.

Spot welding of aluminum alloys, the fundamental problems involved and the present methods of dealing with them is discussed in 16-page booklet issued by P. R. Mallory & Co., Inc. Bulletin CI-220.

Analysis of spectrographic plates or films by means of a new microphotometer is described in a 12-page catalog issued by Leeds & Northrup Co. Quick determinations of elements present in small percentages are made possible. Bulletin BI-46.

Temperature control of galvanizing kettles and types of control systems are described by Brown Instrument Co. Bulletin BF-3.

Precise measurement of tension and compression strains. American Instrument Co. Bulletin Ny-259.

X-Ray Diffraction Unit. General Electric X-ray Corp. Bulletin He-6.

Radium for Industrial radiography. Radium Chemical Co., Inc. Bulletin Bi-345.

Modern Polishing. Tracy C. Jarrett. Bulletin De-303.

Catalog showing line of X-ray film and supplies issued by Picker X-ray Corp. Bulletin BI-347.

Portable hardness tester for aluminum and soft metals is described in new 4-page leaflet by Barber-Colman Co. Bulletin BI-346.

Three types of apparatus for testing small specimens are described by R. Y. Fermer Co. Bulletin BI-347.

Film and plate processing equipment for spectro analysis. Harry W. Dietert Co. Bulletin Af-198.

Gage blocks and optical flats. George Scherr Co. Bulletin Af-200.

High temperature furnaces, control instruments and specialties for the laboratory. Bell Technical Supply Co. Bulletin Je-213.

20-page booklet on Ranarex Instruments for measurement of CO_2 in flue gases, with new text material on the control of furnace atmospheres. Permutit Co. Bulletin BI-339.

Pyrometer controller. Illinois Testing Laboratories, Inc. Bulletin Hb-180.

Thermocouple heads. Claud S. Gordon Co. Bulletin Be-53.

Specific installations of Machler recirculating air heat ovens for normalizing, stress relieving, annealing, bluing, aging, drawing, tempering, etc., are described in interesting leaflet issued by the Paul Machler Co. Bulletin CI-159.

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"Some Common Heat Treating Defects", "Machine Maintenance", "Heat Treating Costs", "Cleaning Machine Barrels After Proof Firing" are titles of interesting articles in January issue of the Houghton Line, published by E. F. Houghton & Co. Bulletin Cf-38.

The many complex factors entering into the proper design of a quench oil cooling system and the Rapid Oil Cooler, with its positive circulation and accurate controls, are described in illustrated bulletin by Bell & Gossett Co. Bulletin BI-367.

Electric furnaces for laboratory and for production heat treatment are comprehensively illustrated and described in newly-revised Catalog issued by Hoskins Manufacturing Co. Bulletin CI-224.

Control of temperatures of quenching baths—water, solutions or oils—in heat treating and wire drawing and the resulting improvement in physical properties, reduction in strength and increase in production, are discussed in bulletin issued by Niagara Blower Co. Bulletin CI-367.

Effective strength of B & W insulating firebrick. Babcock & Wilcox Co. Bulletin Ce-75.

Non-destructive testing. Canadian Radiant & Manufacturing equipment. Adolf I. Buehler. Bulletin Kd-135.

Plating temperatures. Foxboro Co. Bulletin Ne-21.

Universal enclosed terminal head. Arklay S. Richards Co. Bulletin Ne-530.

New direct-reading Hays Viso-Ratio Gage is described in guide as guide to higher combustion efficiency, increased production, better products and lower costs. Gage and air flow exist between gas-flow and gage air flow.

The Hays Corp. Bulletin CI-365.

Standard stereoscopy for measuring the hardness of metals and its many applications are described in a 38-page bulletin issued by Shore Instrument & Mfg. Co. Bulletin CI-381.

New slotted bolt hole slide. Industrial Instrument users to gain maximum life and efficiency from pyrometric equipment, regardless of make. Substitute materials that may be employed in place of critical materials and properties of each are compared by Wheelco Instruments Co. Bulletin CI-110.

New looseleaf data book describes complete line of hardness testing equipment manufactured by Wilson Mechanical Instrument Co. Inc. Bulletin Bi-22.

The Riehle Ci-line of universal testing machines and typical uses are described in interesting new booklet issued by Riehle Testing Machine Div., American Machine and Metals, Inc. Bulletin CI-197.

The modern metallurgical polishing powder, Rite-Tonerite, is described in new booklet issued by Conrad Wolff. Bulletin CI-368.

Industrial ovens, rod bakers, welding rod ovens, furnaces, for an imposing list of manufacturers in many industries are illustrated and described in an attractive booklet available through Carl-Mayer Corp. Bulletin BI-183.

Titanium processed to heat treating bronzes Moly steels to parity with Tungsten and Cobalt high speed steels. Tuff-Hard Corp. Bulletin BI-349.

Rotary hearth furnaces. Lee Wilson Sales Corp. Bulletin Ce-302.

Motorblowers. Ingersoll-Rand Corp. Bulletin Ke-222.

New principle of furnace combustion offers the fastest, most economical heat available, has been developed by Radiant Combustion, Inc. Bulletin Kd-289.

Low pressure oil burners. North American Mfg. Co. Bulletin Na-138.

Industrial furnaces. W. S. Rockwell Co. Bulletin Kd-34.

Modern shell furnaces of a special proved design are described in new leaflet published by Mahr Manufacturing Co. Bulletin BI-346.

Butterfly valves are featured in new 16-page catalog. R-S Products Corp. Bulletin Bi-350.

How the near infra-red process speeds baking, drying, preheating and dehydrating problems. Fostoria Pressed Steel Corp. Bulletin Bi-350.

New heating process for any analysis of steel heat treated to temperatures up to 2000° F. Eliminates oxidation and decarbonization. Alfred Heller Heat Treating Co. Bulletin BI-351.

Gas-fired forge furnaces. Eclipse Fuel Engineering Co. Bulletin Af-226.

Vertical furnace. Sentry Co. Bulletin Ne-114.

Industrial furnaces. Drever Co. Bulletin Ke-321.

Salt bath furnaces. Upton Electric Furnace Co. Bulletin Ed-266.

Atmosphere furnaces. Lithium Corp. Bulletin Je-319.

Industrial carburetors. C. M. Kemp Mfg. Co. Bulletin Ce-219.

Furnace catalog. American Gas Furnace Co. Bulletin Be-113.

Convection air furnace. Despatch Oven Co. Bulletin Nd-123.

Annealing shell gases. Continental Industrial Engineers, Inc. Bulletin Ni-154.

Johnson Gas Appliance Co. catalog describes complete line of burners, furnaces, torches, mixers, valves and blowers. Bulletin He-298.

High temperature fans. Michigan Products Corp. Bulletin Hb-81.

Dehumidifier. Pittsburgh Lectrodryer Corp. Bulletin Bl-187.

Convection furnaces. Hevi Duty Electric Co. Bulletin Ke-44.

Furnaces. Dempsey Industrial Furnace Corp. Bulletin Ke-260.

Liquid carburizer. Park Chemical Co. Bulletin Na-41.

Tocco Process of Induction Hardening. Ohio Crankshaft Co. Bulletin Lc-145.

Carburizing boxes. Pressed Steel Co. Bulletin Ce-269.

Thermocouple generator. Induction Heating Corp. Bulletin Ke-323.

"Stewart Metal Minutes" is title of interesting monthly leaflet presenting notes, comments, news of metal processing published by Chicago Flexsteel Shaft Co. Featured is an index of special interest to heat treating men. Bulletin CI-49.

Specific installations of Machler recirculating air heat ovens for normalizing, stress relieving, annealing, bluing, aging, drawing, tempering, etc., are described in interesting leaflet issued by the Paul Machler Co. Bulletin CI-159.

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Effective strength of B & W insulating firebrick. Babcock & Wilcox Co. Bulletin Ce-75.

Gran structure, strength, mechanical and physical properties of Diamahrl metal castings are comprehensively described in 8-page booklet issued by Diamond Iron Works, Inc. Bulletin Cf-38.

Steel castings. Chicago Steel Foundry Co. Bulletin He-184.

Heat Resisting Alloys. General Alloys Co. Bulletin D-17.

Pipes and tubes. Michigan Steel Casting Co. Bulletin Bb-84.

Wire. Calrite Tungsten Corp. Bulletin Le-327.

Metal Powders. Metals Disintegrating Co. Bulletin Ec-208a.

Sponge iron. Ekstrand & Tholand, Inc. Bulletin Kb-202.

Grain structure, strength, mechanical and physical properties of Diamahrl metal castings are comprehensively described in 8-page booklet issued by Diamond Iron Works, Inc. Bulletin Cf-38.

Bi-metals and Electrical Contacts—"Wilco Blue Book of Thermometers (thermostatic bi-metals) and Electrical Contacts." The H. A. Wilson Company. Bulletin Cf-369.

March, 1942

THE REVIEW

Page 7

Says Strategic Substitution Ends With Steel

Reported by G. L. White

Editor, Canadian Metals & Metallurgical Industries

Ontario Chapter—Discussing strategic and critical metals before the meeting at Toronto on Feb. 6, E. E. Thum, editor of METAL PROGRESS, showed that the process of substitution not only tends to lead to a shortage of the substitute but invariably ends with that most important material, steel. Total non-ferrous metal production in the United States amounts to only 6% of steel production.

Citing tungsten as an example of a strategic material, he showed how large quantities of tool steels are needed for the expansion of industry to fit out machines and stock tool cribs. By a careful study of trend over a long period in the use of tungsten in relation to steel output, it was possible to make a very accurate estimate of the tungsten consumption for 1941.

Tungsten Conservation Affects Mo

To ease the situation in regard to tungsten, users have been required to accept a definite proportion of high molybdenum tool steel with every order of high tungsten steel.

When this plan went into effect there were stocks of molybdenum available, as well as very large current production from mines in the Rocky Mountains, but the extra demand from this quarter, coupled with other quantity requirements resulting from the war, have now made molybdenum supplies a matter of some concern.

The shift of sources of manganese supplies, necessitated by the war, was also discussed and it was shown how the problem of manganese conservation had been tackled quickly. With the installation of suitable heat treating equipment, manufacturers have been able to change over to a lower manganese steel for high explosive shells.

Large Chromium Deposit Developed

Search for chromium supplies has resulted in the development of a large deposit in the United States, which, with efficient concentration methods, will supply a major fraction of the requirements.

Tremendous increases are on the way in output of aluminum and magnesium.

The steel industry may have difficulty in maintaining the rate of output of 1941 during 1942 because of the scrap situation, but a blast furnace expansion program is being pushed to bring the whole iron and steel picture into balance as rapidly as possible.

Modern Diesel Engines Subject at Golden Gate

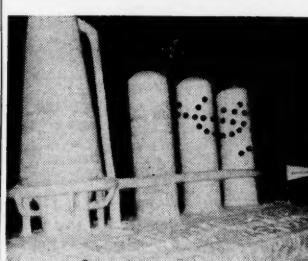
Reported by W. P. Wallace
Metallurgist, Columbia Steel Co.

Golden Gate Chapter—Meeting jointly with members of the American Foundrymen's Association on Feb. 16, the Chapter heard a very interesting address on modern diesel engines. Serge Kovaleff, plant manager of the South San Francisco plant, Enterprise Engine and Foundry Co., spoke.

Mr. Kovaleff traced the early history of the diesel engine, the difficulties encountered, and described the more modern engines of today.

Ed Walsh, chairman of the American Foundrymen's Association, was introduced and the functions of the War Products Advisory Board were described by Chapter Chairman William Kennedy.

Blast Furnace of Ice



Blast Furnace — Steel — Victory Formed the Theme of the Ice Blast Furnace Built by Michigan Tech's A.S.M. Members. The statue took first prize under all-campus competition. It took six days to build, was 18 ft. high, and weighed approximately 14 tons.

Tells of Urgent Need for Clean, Sound Castings

Reported by I. J. Levinson

Michigan College of Mining & Technology

Michigan College of Mining and Technology Chapter—To a packed audience of some 200-odd students and faculty members of the A.S.M. and A.S.M.E., J. J. Ewens of the Grede Foundries, Milwaukee, discussed "The Design of Steel Castings". His talk was supplemented by a series of sound slides from the Steel Founders Society.

Mr. Ewens discussed the present urgent need for good, clean, sound castings. Alloy element substitution, tolerance limitations, and sand control were stressed.

Mr. Ewens predicted the more extensive use of X-rays as a solution of the sound casting problem. At the end of the movie, questions were discussed.

The Michigan Tech Chapter's ice blast furnace took first prize in the annual Winter Carnival snow statue contest. The furnace was built by the members under the supervision of Al Bender, senior metallurgy student from Detroit, the faculty providing the technical staff.

Weldments Vs. Castings Vs. Forgings Argued

(Continued from page 1)

most heavy ordnance, forgings are generally considered ideal.

Most competition among the metal-forms discussed exists between weldments and gray iron castings, although even here it is not always remembered that welding's rapid growth has been largely due to its use for new designs and products and for replacing riveted construction (as in ships, today) rather than at the expense of cast iron.

The technical quality of welds, through the wide use of coated rods, is now generally on a par with that of the base metal. Castings are often considered to be somewhat variable in quality, but Dr. Hoyt emphasized that castings can be made perfectly sound by modern processing and control.

The arguments for welding in a given case may include a saving in weight and, particularly where the number of units to be made is small, greater economy. Much material and time can also often be saved by welding.

On the other hand, metal-distribution is better with casting. Highly stressed parts require only generous fillets if cast, but if welded, the welding must be done from both sides—often a nearly impossible requirement.

Members of the local chapters of the American Foundrymen's Association and the American Welding Society were guests at the lecture.

Chemist and Metallurgist Cooperate in Applying Stainless to Process Industries

Reported by Ellis Bladé
and Fred Heinzelman, Jr.

New York Chapter—"Metallurgical Problems in Chemical Engineering" was the topic ably presented on Feb. 9. The speaker was George A. Sands, metallurgical engineer with the Electro Metallurgical Co.

Speaking from the viewpoint of the consumer, Mr. Sands emphasized the experience of the process industries with application of stainless steels to the production of heavy chemicals. Some of the economic factors governing the type used are initial cost, estimated service life, allowable contamination of the product, and the limitations of fabricating methods.

Successful solution of the problem has gradually evolved through close cooperation of the chemist and the metallurgist.

The newer welding techniques, with subsequent heat treatments, have eliminated the uncertainties inherent in former riveted structures. Thus in the low carbon, straight 15 to 30% Cr ferritic steels, grain growth, with its weakening effect, was decreased by the addition of nitrogen.

The addition of nickel, a strong austenite-forming element, resulted in the formation of the austenitic series of chromium-nickel alloys with increased ductility, toughness, creep resistance and resistance to the reducing type of corrosion. In many instances, the older straight chromium ferritic steels have been completely displaced as a result of the great advances in welding the austenitic chromium-nickel compositions.

Quenching welded chromium-nickel steels and 18-8 types from a high temperature may be largely dispensed with if columbium and titanium are present. The columbium and titanium additions to these austenitic steels now make it

possible to stress relieve equipment made from these steels in accordance with Code regulations. The addition of molybdenum to these steels has greatly reduced the pitting type of corrosion.

In the second part of his talk, Mr. Sands discussed the structural, physical and chemical properties of stainless steels in relation to their applications. The various points were clarified by projected charts and micrographs.

An unusual note was the presentation by John Fromm of an illustrated lecture on silver fox ranching in the cold woods of northern Wisconsin. Miss J. Z. Briggs, attractive metallurgist of the Crucible Steel Co., took part by modeling the fine exhibit of fur garments (about \$6000 worth), to the delight of all those present.

ANOTHER

NEW BOOK!

HARDNESS and HARDNESS MEASUREMENT

By Prof. S. R. Williams, Amherst College
550 pages . . . 338 illus. . . 6 x 9 . . . red cloth binding.

SPECIAL PRE-PUBLICATION PRICE
\$6.00 (after May 1—\$7.50)

Since the days of the last World War the author has been engaged in the study of hardness. Thus, it was only natural that his lecture series on this subject at the National Metal Congress attracted wide attention.

Now this material is collected into a compact, profusely illustrated book—a "Bible" for all interested in hardness testing. There is so much information in this book that you will want to keep it by you as a constant reference source for anything pertaining to hardness testing.

Reserve your copy today at the special pre-publication saving.

AMERICAN SOCIETY FOR METALS
7301 Euclid Ave. Cleveland, O.

A NEW BOOK ON THE PRESS!

HEAT FLOW IN METALS

By J. B. Austin, U. S. Steel Corp. Research Laboratory

Available at special pre-publication price
140 pages . . . 60 illustrations . . . 6 x 9 . . . cloth binding
\$2.00 (after May 1—\$2.50)

Daily during the past Metal Congress a crowd of enthusiastic metal men gathered to hear Dr. Austin deliver his Educational Lecture series on Heat Flow in Metals.

Now this material is being gathered into one compact book which is available to ASM members at a special pre-publication price until May 1st. Dr. Austin first discusses the nature of heat and of metallic conduction, which he illustrates with tables, charts and photographs. Then he relates the factors influencing the thermal conductivity of metals; the basic laws of heat conduction and heat flow in the steady state and in the unsteady state.

This book is written in language particularly designed for easy reading. Its many charts, tables and graphs make up a store of information which is obtainable at a glance. Write today for your copy at the special pre-publication saving!

American Society for Metals

7301 Euclid Ave.
Cleveland, Ohio

Bach Discusses Heat Treating Problems



At the February Meeting of the Worcester Chapter, Left to Right: Chairman Robert I. Belmont; Speaker A. Dudley Bach, President, New England Metallurgical Corp.; and Lloyd G. Field, Superintendent of Worcester Plant of New England Metallurgical Corp., Technical Chairman.

Change-Over to the Mo Steels Described

Reported by John R. Doble
American Steel & Wire Co.

Worcester Chapter—A. Dudley Bach, president of the New England Metallurgical Corp., spoke on "Steel Selection and Heat Treatment" on Feb. 11.

Mr. Bach is an able heat treater and is constantly doing the work which others so often glibly say is just part of the book. He has weathered many a heat treat problem, and for the second time in two years was generous enough with his time to come to Worcester to tell us how he had been able to live through his troubles.

The talk first included a brief summary of present problems in changing to molybdenum bearing high speed steels. Next he spoke on the common tool steels and covered the substitutes for the steels of higher chromium content.

Then with the aid of colored slides he explained how problems of everyday work are handled in his heat treating plant. Causes of cracking and warping were discussed.

Pointers on steel selection, handling, and treatment were given—not as cures but as suitable workable methods on particular pieces.

He also spoke of his flame hardening work, stressing the importance of the human element in these operations.

Lloyd G. Field, technical chairman, introduced Mr. Bach to the gathering.

Complexity of Cast Iron Composition Indicated

Reported by Amos D. McGary
Metallurgist, International Chain & Mfg. Co.

York Chapter—R. G. McElwee, metallurgist of Vanadium Corp. of America, addressed the February meeting on "Modern Cast Irons".

The complex composition of cast iron has often been overlooked and the effects of the various elements added as alloying constituents have often been misunderstood by the foundryman. Carbon and silicon control was emphasized, and with these two elements the production of cast iron can be controlled to attain a wide variation in physical characteristics in cast iron.

Mr. McElwee's talk was given earlier in the season before the Detroit Chapter of the Society and is reported in detail in the February issue.

Saunders Clarifies Hardenability; Debut Before Home Chapter

Reported by N. B. McLaren
Brown & Sharpe Mfg. Co.

Rhode Island Chapter—Regular news commentator and REVIEW reporter Walter M. Saunders, Jr. has purposely refrained from reporting the February meeting, since he was the principal speaker that night. Walter made his debut before the home chapter in the presentation of the controversial subject of "Hardenability".

The individual conceptions of hardenability such as case hardness, depth of hardness, hardness by etching-depth at which certain Brinell or Rockwell hardnesses are obtained, file hardness—all these related terms contribute to make the definition of hardenability indefinite.

The present definition of Bain, namely, "Hardenability is the name applied to the particular property of steels at elevated temperature which determines their ability to just transform to a substantially martensitic

condition at lower and lower rates", is considered the acceptable one.

"Sounds deep, doesn't it", said Walker, and proceeded to speak in plain language of the symptoms and manifestations of the subject in question.

Some of the various factors affecting hardenability, such as (a) austenite composition, (b) amount, nature and distribution of insoluble particles in austenite, (c) austenitic grain size at time of quenching, (d) size of specimen, (e) heat abstracting power of quench, were excellently described to the 150 members present.

Walker then proceeded with the aid of slides to describe the various hardenability tests such as the Shepherd P-F test for tool steels, the Burns, Moore and Archer S-A-C test, and the Jominy end-quench method.

In an interesting coffee talk Mr. Morely of the local F.B.I. presented some excellent advice as to how laymen can cooperate effectively with the F.B.I.

Pyrometer Instrument Co., manufacturers of Pyro optical pyrometers, has announced its recent move to larger quarters at 101-105 Lafayette St., New York City.

Employment Bureau

Address answers care of A. S. M., 7301 Euclid Ave., Cleveland, unless otherwise stated.

Positions Open

ASSISTANT METALLURGIST: Experienced in plant processes, problems and specifications in manufacture of stainless steel bars and wire. Married man preferred. Give references and details of education and experience. Eastern location. Box 3-5.

ASSISTANT PLANT ENGINEER: Duties will include construction and maintenance of buildings and equipment. Applications, giving full information with respect to education and experience and enclosing photograph which will not be returned, should be addressed to Walter S. Giele, Lebanon Steel Foundry, Lebanon, Pa.

METALLURGISTS: The Civil Service Commission is seeking metallurgists for work in Government navy yards, arsenals and other war agencies. The positions pay from \$2000 to \$5000 per year and will last for the duration of the war. Sending application forms, obtainable in any first or second-class post office, to the Commission in Washington, D. C., is all that is necessary to be considered for these positions.

NON-FERROUS CHEMIST: Experienced man for permanent position in analysis of brass, bronze, bearing metals, aluminum, and magnesium. Knowledge of ferrous, organic, and miscellaneous analysis desired. State in letter full experience background and approximate salary expected. Middle west location. Correspondence strictly confidential. Inquiries desired from qualified applicants only. Box 2-5.

ALLOY STEEL SALESMAN: If you are a young man with a technical education and some steel sales experience, there is an opening for you in Cleveland, New England, Buffalo, Indianapolis and Milwaukee selling steel (on salary) for an expanding and aggressive new steel company. When writing give complete data, including your draft classification. All communications will be kept strictly confidential. Box 3-20.

METALLURGIST: Experienced, for aircraft parts factory in New England. Box 3-40.

METALLURGIST: 28 to 30 years of age, with 10 to 15 years plant experience, preferably on the practical side. Position open immediately, but time will be allowed for necessary arrangements. Good salary. Location Buffalo. Box 3-45.

Positions Wanted

HEAT TREAT FOREMAN: 23 years practical experience, 14 years as foreman and instructor. Capable of advising in selection of tool and alloy steels, heat treating equipment and supplies. Married, 43 years of age; eastern location preferred. Box 3-10.

HEAT TREATER: 27 years of age; at present located in New York City, but willing to move. Six years experience in general heat treatment in all its phases; one year of metallography. Box 3-15.

HEAT TREAT SUPERVISOR AND METALLURGIST: Age 33, draft classification 3-4, 7 years tool, alloy and stainless steel manufacturing. Good knowledge of steel drop forging, testing, inspection, and research; also cyanide, carburizing, continuous atmosphere controlled hardening and annealing furnace experience. Box 3-30.

METALLURGICAL ENGINEER: Master's degree and 18 years experience in ferrous metallurgy and industrial research. Age 45. Can give matured and well-balanced service in return for good salary. West coast preferred. Box 3-35.

POWDER METALLURGIST: Graduate metallurgical engineer. Ten years experience in powder metallurgy—research, process engineering, both ferrous and non-ferrous. Box 3-50.

CHAPTER CALENDAR

CHAPTER	DATE	PLACE	SPEAKER	SUBJECT
Boston	Apr. 10			Joint Meeting with Army Ordnance Association
Buffalo	Apr. 9	Hotel Buffalo	Gilbert Soler	Manufacture of Electric Furnace Alloy Steels
Calumet	Apr. 21	Woodmar Country Club, Hammond, Ind.	Harry W. Dietert	Construction and Operation of the Spectrograph
Canton-Mass.	Apr. 23		W. C. Pierce	Theory and Determination of the Elements
Chicago	Apr. 9	Chicago Bar Asso.	H. M. Webber	Electric Furnace Brazing
Cleveland	Apr. 6	Cleveland Club	Bradley Stoughton	Metallurgy in National Defense
Columbus	Apr. 14	Fort Hayes Hotel	Lt. Robb James	Ordnance Material Inspection
Dayton	Apr. 8	Engineers Club	G. M. Enos	Ordnance Inspection
Detroit	Apr. 13		E. S. Davenport	Transformation of Austenite
Hartford	Apr. 14	Hartford Electric Light Co.	Ralph W. E. Lefler	Deep Drawing of Sheet and Strip Steel
Indianapolis	Apr. 20	Washington Hotel	George M. Enos	Metallurgical Inspection in Ordnance
Lehigh Valley	Apr. 11	Hotel Traylor, Allentown, Pa.		Annual Dinner Dance
Los Angeles	Apr. 23	Scully's Cafe	James H. Knapp	Atmospheric Control Furnace Design
Milwaukee	Apr. 21	Milwaukee Athletic Club	H. L. Gerhard	Plastics
Montreal	Apr. 6	Windsor Hotel	Sir Frederick Bowhill	
Montreal	Apr. 27	Windsor Hotel	Lloyd Woodside	Molybdenum High Speed Steels
New Haven	Apr. 16	Conn. Light & Power Co.	G. R. Brophy	Some Interesting Metal Investigations
New Jersey	Apr. 20	Essex House, Newark	G. J. Comstock	Applications of a Powdered Metal Part
New York	Apr. 13	Bldg. Trade Employers Assn.	John L. Christie	Silver Brazing Alloys
North West	Apr. 20	Coffman Memorial Union, Univ. of Minn.	A. G. Green	Practice of Grinding and Other Abrasive Applications
Northwest Pa.	Apr. 9	Corry, Pa.	M. F. Judkins	Applications of Powder Metallurgy
Notre Dame	Apr. 8	Engineering Audit, Univ. of Notre Dame	H. H. Harris	Industrial Use of Heat and Corrosion Resistant Alloys
Ontario	Apr. 10	Toronto	N. K. Koebel	Controlled Atmospheres for Heat Treating Steels
Oregon	Apr. 15	Heathman Hotel	Al. Zima	Effect of Alloy Steels in Design
Penn State	Apr. 24-25			Fifth Pennsylvania Inter-Chapter Meeting
Peoria	Apr. 13	Pere Marquette Hotel	Henry T. Head	
Philadelphia	Apr. 17	Engineers Club	D. K. Cramp頓	Age Hardening Alloys of Copper
Pittsburgh	Apr. 9	Roosevelt Hotel	J. C. Fox	Die Casting of Non-Ferrous Metals
Puget Sound	Apr. 8	Frye Hotel	John Mitchell	Selection and Conservation of Alloying Elements in Steel
Rhode Island	Apr. 1		John E. Wiggin	Practical Metallurgy in Manufacture and Use of Files
Rochester	Apr. 13	Lower Strong Audit, Univ. of Roch.		
Rockford	Apr. 22	Elks Club	R. S. Archer	
Rocky Mt.	Apr. 17	Oxford Hotel	W. D. Coplin	Diesel Engines
Saginaw Valley Group	Apr. 21	Frankenmuth, Mich.	A. L. Boegel	Metallurgy of Ferrous Metals
Schenectady	Apr. 14	Rensselaer Polytech. Inst.	R. F. Mehl	Structure of Pearlite
Springfield	Apr. 20	Hotel Sheraton	Frank Laque	Corrosion with Particular Reference to Galvanic Effects
St. Louis	Apr. 17	York Hotel	R. C. Tittel	Heat Flow in Metals
Syracuse	Apr. 7	Onondaga Hotel	Waldemar Naujoks	Stainless Forgings in Industry
Texas	Apr. 23	River Oaks Country Club	A. L. Kaye	
Toledo Group	Apr. 27	Hillcrest Hotel	Carl F. Joseph	Armasteel
Tri-City	Apr. 14			
Worcester	Apr. 8	Sanford Riley Hall, W.P.L.		Special Meeting—Members Only
York	Apr.	Harrisburg, Pa.	Earnshaw Cook	Steel Making

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